



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 12354-3:2000

ICS 91.120.20

**BUILDING ACOUSTICS - ESTIMATION OF
ACOUSTIC PERFORMANCE OF BUILDINGS
FROM THE PERFORMANCE OF ELEMENTS -
PART 3: AIRBORNE SOUND INSULATION
AGAINST OUTDOOR SOUND**

National Standards
Authority of Ireland
Dublin 9
Ireland

Tel (01) 807 3800
Tel: (01) 807 3838

*This Irish Standard was
published under the
authority of the National
Standards Authority of
Ireland
and comes into effect on
June 30, 2000*

**NO COPYING WITHOUT NSAI
PERMISSION EXCEPT AS
PERMITTED BY COPYRIGHT
LAW**

© NSAI 2000

Price Code J

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12354-3

March 2000

ICS 91.120.20

English version

**Building acoustics - Estimation of acoustic performance of
buildings from the performance of elements - Part 3: Airborne
sound insulation against outdoor sound**

Acoustique du bâtiment - Calcul de la performance
acoustique des bâtiments à partir de la performance des
éléments - Partie 3: Isolement aux bruits aériens venus de
l'extérieur

Bauakustik - Berechnung der akustischen Eigenschaften
von Gebäuden aus den Bauteileigenschaften - Teil 3:
Luftschalldämmung von Außenbauteilen gegen Außenlärm

This European Standard was approved by CEN on 22 January 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Relevant quantities	5
3.1 Quantities to express building performance	5
3.1.1 Apparent sound reduction index R'_{45°	5
3.1.2 Apparent sound reduction index $R'_{tr,s}$	5
3.1.3 Standardized level difference $D_{2m,nT}$	5
3.1.4 Normalized level difference $D_{2m,n}$	6
3.1.5 Relations between quantities	6
3.2 Quantities to express element performance	6
3.2.1 Sound reduction index R	7
3.2.2 Element normalized level difference $D_{n,e}$	7
3.2.3 Other relevant data	7
3.3 Other terms and quantities	7
4 Calculation models	8
4.1 General principles	8
4.2 Determination of direct transmission from acoustic data on elements	9
4.2.1 Small elements	9
4.2.2 Other elements	10
4.3 Determination of flanking transmission	10
4.4 Interpretations	10
4.5 Limitations	11
5 Accuracy	11
Annex A (normative) List of symbols	12
Annex B (informative) Determination of transmission by elements from composing parts	14
Annex C (informative) Influence of façade shape	17
Annex D (informative) Sound reduction index of elements	21
Annex E (informative) Estimation of indoor sound levels	25
Annex F (informative) Calculation examples	26
Bibliography	29

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 126 "Acoustic properties of building products and of buildings", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

It is the first version of this standard which forms a part of a series of standards specifying calculation models in building acoustics :

- Part 1: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 1 : Airborne sound insulation between rooms.*
- Part 2: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 2 : Impact sound insulation between rooms.*
- Part 3: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3 : Airborne sound insulation against outdoor sound.*
- Part 4: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 4 : Transmission of indoor sound to the outside.*
- Part 5: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 5 : Noise from technical installations and equipment.*
- Part 6: *Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 6 : Sound absorption in enclosed spaces.*

The accuracy of this standard can only be specified in detail after widespread comparisons with field data, which can only be gathered over a period of time after establishing the prediction model. To help the user in the mean time, indications of the accuracy have been given, based on earlier comparisons with comparable prediction models. It is the responsibility of the user (i.e. a person, an organisation, the authorities) to address the consequences of the accuracy, inherent for all measurement and prediction methods, by specifying requirements for the input data and/or applying a safety margin to the results or applying some other correction.

Annex A (normative) forms an integral part of this part of EN 12354, Annexes B, C, D, E and F are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a calculation model to estimate the sound insulation or the sound pressure level difference of a façade or other external surface of a building. The calculation is based on the sound reduction index of the different elements from which the façade is constructed and it includes direct and flanking transmission. The calculation gives results which correspond approximately to the results from field measurements according to EN ISO 140-5. Calculations can be carried out for frequency bands or for single number ratings.

The calculation results can be used also for calculating the indoor sound pressure level due to for instance road traffic ; this use is treated in the informative annex D.

This document describes the principles of the calculation model, lists the relevant quantities and defines its applications and restrictions. It is intended for acoustical experts and provides the framework for the development of application documents and tools for other users in the field of building construction, taking into account local circumstances.

The model is based on experience with predictions for dwellings ; it can also be used for other types of buildings provided the dimensions of constructions are not too different from those in dwellings.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prEN 12354-1:1999, *Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1 : Airborne sound insulation between rooms.*

EN 20140-10, *Acoustics - Measurement of sound insulation in buildings and of building elements - Part 10 : Laboratory measurement of airborne sound insulation of small building elements (ISO 140-10:1991).*

EN ISO 140-1, *Acoustics - Measurement of sound insulation in buildings and of building elements - Part 1 : Requirements for laboratory test facilities with suppressed flanking transmission (ISO 140-1:1997).*

EN ISO 140-3, *Acoustics - Measurement of sound insulation in buildings and of building elements - Part 3 : Laboratory measurements of airborne sound insulation of building elements (ISO 140-3:1995).*

EN ISO 140-5, *Acoustics - Measurement of sound insulation in buildings and of building elements - Part 5 : Field measurements of airborne sound insulation of façade elements and façades (ISO 140-5:1998).*

EN ISO 717-1, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 1 : Airborne sound insulation (ISO 717-1:1996).*

EN ISO 11654, *Acoustics – Sound absorbers for use in buildings - Rating of sound absorption (ISO 11654:1997).*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-